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Dysthyroidism in patients with psychiatric disorders in Morocco

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Abstract

Aim: In this study, we aimed to explore the association between dysthyroidism and psychiatric disorders and to verify whether there are sociodemographic or family variables that can determine the likelihood of this comorbidity.

Material and Methods: A descriptive, analytical, cross-sectional and retrospective study, involved patients aged between 18 and 65 years, followed for thyroid pathologies comorbid with psychiatric disorders.

Results: The participants were women with the median age of 52 years, 69.4% of patients presented a mood disorder, 30.6% had another psychiatric disorder, 6.1% presented a clinical goiter with a normal biological assessment, 8.2% presented hyperthyroidism and 85.7% presented hypothyroidism. Age, family situation, obstetrical, family and surgical ATCD, therapeutic compliance of psychiatric and thyroid disease and pharmacological treatment of psychiatric disorders are variables that present a statistically significant difference with a P <0.05 between the two groups.

Discussion: Dysthyroidism and especially hypothyroidism is associated more with mood disorders than other psychiatric disorders in hospitalized patients.

Keywords

Mood Disorder, Dysthyroidism, Woman, Morocco

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Introduction

The occurrence of mental disorders during endocrine pathologies has been established for more than a century. Conversely, psychological trauma may play a role in triggering certain endocrinopathies.

The association between thyroid function and psychiatric disorders, especially mood disorders, was recognized more than 200 years ago [1, 2]. Patients with mood disorders, including bipolar disorders and depressive disorders have a high prevalence of somatic comorbidity compared to the general population [3, 4]. Hypothyroidism is relatively common in these patients [4], this comorbidity would be correlated with a high risk of relapses and resistance to treatment, and suicide attempts [5, 6]. It is well established that the use of psychiatric drugs (eg lithium) increases the risk of thyroid dysfunction [3, 4, 7]

The role of thyroid dysfunction in depression is recognized [8]. Depressive symptoms often occur in patients with thyroid disorders and, conversely, patients with depression may have various thyroid abnormalities, including high or low levels of thyroid hormones [1].

Recent studies have confirmed a strong association between thyroid dysfunction in patients with mood disorders [9]. For example, Ojha et al reported that 21.4% of depressed patients had abnormal thyroid function, 11.4% met criteria for subclinical hypothyroidism, 5.7% for subclinical hyperthyroidism, and 4.3% for overt hypothyroidism [10]. Regarding the relationship between thyroid dysfunction and bipolar disorder, a recent study by Ying Zhao et al shows that early onset of bipolar disorder is correlated with higher rates of hypothyroidism [11].

In addition, thyroid dysfunction could have a significant influence on the cognition and emotion of those affected [1]. However, although previous studies have revealed associations between mood disorders and thyroid dysfunction, the roles of thyroid hormones, including free triiodothyronine (FT3), free thyroxine (FT4), (TSH), anti-thyroglobulin (TgAb) and anti-thyroid peroxidase antibodies (TPOAb) in the pathological mechanisms of mood disorders were not yet clear [1, 12].

The main objective of this study was to explore the association between dysthyroidism and psychiatric disorders, to confirm this association especially in patients with mood disorders and to verify whether there is a sociodemographic or family profile that may determine the likelihood of this comorbidity.

Material and Methods

A descriptive, cross-sectional, retrospective study made at the Ar-Razi Sale Psychiatric University Hospital in Morocco, from January 2014 to January 2020.

Data Collection

This study focused on patients whose age varied between 18 and 65 years. The female sex was chosen in our study due to a high frequency of this comorbidity in women compared to men during our research at the level of the Ar-Razi Psychiatric University hospital for patients followed for thyroid pathologies comorbid with psychiatric disorders whose diagnosis was based on the DSM 5 diagnostic criteria. The records of male patients, female patients under the age of 18 and records with missing data were excluded. The clinical data was collected using a pre-established exploitation sheet with socio-demographic data (age, origin, profession, socio-economic level, marital status), clinical data (personal and family history, circumstances of consultation, revealing psychiatric manifestations). The collection of clinical data was carried out with respect for the anonymity and confidentiality of patients with medical records from the archives of the Ar-Razi Psychiatric University Hospital.

Statistical analysis

Statistical analysis was carried out using JAMOVI software for Windows 2016. Qualitative variables were presented as frequencies and percentages, quantitative variables were presented in mean standard deviation (SD) or median (interquartile range, IQR). The Chi-square (x2) test or Fisher's exact test were carried out according to their particular application conditions to identify the differences in the proportions of the categorical variables between the two groups (Group 1: dysthyroidism comorbid with a disorders, Group 2: dysthyroidism comorbid with another psychiatric disorder other than a mood disorder). In addition, multivariate logistic regression analyzes are used to identify risk factors. Independent variables presenting a statistically significant value with $P < 0.05$ between the two groups were taken into account in multivariate logistic regression.

Results

A total of 49 participants who met the study criteria were included in the study. The average age was 52 [41.59] years, more than half (53.1%) had a secondary education level, 55.1% were married, 95.9 % lived with a family, 55.1% did not have a profession. the majority were without antecedents 73.5%, and 28.6% without a child. More than half (69.4%) have a mood disorder, 30.6% had another psychiatric disorder (not a mood disorder). The majority (85.7%) had hypothyroidism, 6.1% had a clinical goiter with a normal biological assessment, 8.2% present hyperthyroidism.

Psychiatric disorder and dysthyroidism

By comparing the two groups and using the Chi-square (x2) test or Fisher's exact test, we found that there is a statistically significant difference with a $P < 0.05$ for age, family situation, obstetrical history, family and surgical, therapeutic compliance of psychiatric and thyroid disease and pharmacological treatment of psychiatric disorders see (Table 1).

Multinomial logistic regression

Using multivariate logistic regression and adjusting for confounding factors, concluding that being old, single, with surgical ATCDs and poor treatment compliance are risk factors for developing a mood disorder or even (Table 2).

Discussion

According to the results of our study, the participants were women with a median age of 52 [41.59] years, more than half (53.1%) had a secondary education level, the majority had no background 73.5%, 69.4% of patients presented a mood disorder, 30.6% had other psychiatric disorder (without mood disorder), 6.1% presented a clinical goiter with a normal biological assessment, 8.2% presented a hyperthyroidism and 85.7% presented a hypothyroidism.

Age, family situation, obstetrical, family and surgical history,

therapeutic compliance with psychiatric and thyroid disease and pharmacological treatment of psychiatric disorders are variables that present a statistically significant difference with a P <0.05 between the two groups.

Risk factors for developing a mood disorder were older age, being single, a history of surgery and poor adherence to treatment for psychiatric disorders and dysthyroidism.

The female sex was chosen in our study due to a high frequency of this comorbidity in women compared to men. Several studies confirm our observation and found that women were associated with an increased risk of hypothyroidism comorbid with mood disorder [11].The same results were obtained in a retrospective cohort study, which included 13,017 subjects, and which revealed that the rate of depression was twice as high in women with TSH levels above 2.3 µIU/Ml [13].

In the present study the median age was 52 [41.59] years, and our results consistent with a recent study which showing that the prevalence of hypothyroidism in the subgroup with an age below 50 years was 8.53%, which was lower than that of patients over 50 years old, which was (10.8%) [11]. It is also it is consistent with another previous study that age was a risk factor for hypothyroidism [14].

Table 1. The socio-demographic and clinical characteristics of the 2 groups of patients

Characteristics	n (%) (N=49)	Mood disorder	No mood disorder	P
Age	52[41,59]	55[45.5,60.8]	42[36,48]	0.008
Family situation				
Single	12(24.5%)	1(8.3%)	11(91.7%)	<0.001
Divorce	9(18.4%)	9(100%)	0(0%)	
Married	27(55.1%)	23(85.2%)	4(14.8%)	
Widow	1(2%)	1(100%)	0(0%)	
Obstetric ATCDs				
G1P1	8(16.3%)	5(62.5%)	3(37.5%)	0.008
G2P2	15(30.6%)	14(93.3%)	1(6.7%)	
G3P3	10(20.4%)	8(80%)	2(20%)	
G4P4	2(4.1%)	2(100%)	0(0%)	
Without	14(28.6%)	5(35.7%)	9(64.3%)	
Surgical ATCDs				
No	31(63.3%)	18(58.1%)	13(41.9%)	0.024
Yes	18(36.7%)	16(88.9%)	2(11.1%)	
Therapeutic compliance for psychiatric illness				
Good	17(34.7%)	15(88.2%)	2(11.8%)	0.037
Bad	32(65.3%)	19(59.4%)	13(40.6%)	
Pharmacological treatment				
Antidepressant	14(28.6%)	14(100%)	0(0%)	<0.001
Antipsychotic	15(30.6%)	0((0%)	15(100%)	
Antipsychotic+mood stabilizer	11(22.4%)	11(100%)	0(0%)	
mood stabilizer	1(2%)	1(100%)	0(0%)	
Antidepressant + mood stabilizer	8(16.3%)	8(100%)	0(0%)	
Treatment adherence for dysthyroidism				
Good	39(79.6%)	32(82.1%)	7(17.9%)	<0.001
Bad	10(20.4%)	2(20%)	8(80%)	
Type of dysthyroidism				
Goiter with bio-normal assessment	3(6.12%)	3(100%)	0(0%)	0.070
Hyperthyroidism	4(8.16%)	1(25%)	3(75%)	
Hypothyroidism	42(85.71%)	30(71.4%)	12(28.6%)	

Our results show that the association between dysthyroidism and psychiatric disorders is frequent, especially with mood disorders in 69.4% of patients, these results are consistent with the results of a recent study that shows an association between early onset of a psychiatric disorder and hypothyroidism, which may be present specifically in mood disorders, rather than non-specifically in other serious mental illnesses, as this association has not been observed in schizophrenia [11].

According to our results and the results of previous studies, there is a relationship between thyroid dysfunction and mood disorders. Thyroid hormones have multiple effects on body homeostasis and metabolism [15]. It is therefore not surprising that there are documented relationships between thyroid status and mood disorders. Specifically, thyroid disorders may increase the risk of mood disorders and the rate of depression is high in people with hypothyroidism [16].

Thyroid hormones exert a profound influence on behavior and appear capable of modulating the phenotypic expression of major mood disorders. Indeed, a recent study found that there is evidence that triiodothyronine (LT3) can accelerate antidepressant response to antidepressants, and that LT3 can also increase the response to antidepressants in depression resistant to medical treatment [17], always in the same study, adjunctive treatment with supraphysiological doses of levothyroxine (LT4) has shown its effectiveness in several studies, including rapid cycling and prophylaxis-resistant bipolar disorder, and in refractory acute unipolar or bipolar depression [17]. Another explanation for this comorbidity is related to immune system abnormalities that are seen in both thyroid and depressive disorders, but although the most common cause of thyroid disorders is autoimmune disease, dysregulated immune

Table 2. Multivariate analysis between the two groups of patients.

Binomial logistic regression				
Characteristics	P	Confidence interval		Odds ratio
		Lower	Upper	
Age	0.012	0.879	0.984	0.930
Family situation				
Married-single	<0.001	0.00158	0.159	0.0158
Divorced-single	0.995	0.00000	Inf	2.89e-10
Widowed-single	0.998	0.00000	inf	2.89e-10
Evolution time	0.0417	0.868	1.2	0.941
Social Security				
RAMED-MUTUAL*	0.154	0.611	22.579	3.714
Without-mutualist	0.085	0.833	16.553	3.714
Obstetric ATCDs				
G2P2-G1P1	0.093	0.00994	1.43	0.119
G3P3-G1P1	0.416	0.05054	3.43	0.417
G4P4-G1P1	0.992	0.00000	Inf	1.06e-7
Without-G1P1	0.232	0.49536	18.17	30.000
Surgical History				
Yes-No	0.035	0.0338	0.887	0.173
Therapeutic compliance for psychiatric pathology				
Bad-Good	0.005	10.000	26.332	5.132
Treatment adherence for dysthyroidism				
Bad-Good	0.001	31.710	105.445	18.286

*Medical Assistance Scheme for Economically Deprived Persons

function, and not autoimmunity, is more clearly documented in depression [18, 19].

In addition to a high frequency of this comorbidity, resistance to antidepressant treatment is also documented. Bruce M. Cohen reported that depression in patients with high TSH levels is less severe but more resistant to treatment and he observed a weaker antidepressant response, especially to selective serotonin reuptake inhibitors, in patients with major depression and higher TSH levels, with no correlation of response to serum T 3 or T 4 levels [20].

The complex relationship between selective serotonin reuptake inhibitors and thyroid function remains clarified, on the one hand, hypothyroidism alters responses to SSRIs [20], and on the other hand, SSRIs cause a decrease in T4 levels, of free T4 and triiodothyronine (T3) without an appropriate compensatory response in TSH [21], one of the hypotheses to answer this question is that major depression is associated with a subtle chronobiological dysregulation of the hypothalamic-pituitary-thyroid axis (HPT) [22].

There are several limitations to this study. First, no causal relationship could be established due to the cross-sectional design of this study. Future studies should use a longitudinal study design to better explore the causal relationship of these variables in patients with this comorbidity.

Second, the minimal number of patients was 49. Future research should include a wider range of patients with this comorbidity and both females and males.

Third, some confounding factors that may play an important role in mood disorders, and future research should incorporate more confounding factors to better elucidate the pathological mechanisms underlying the association between thyroid dysfunction and psychiatric disorders. Finally, we did not have a healthy control group in this study. Therefore, our results in this study should be considered preliminary, which merits replication in future studies before we can draw any conclusions.

Conclusion

Dysthyroidism and especially hypothyroidism are associated more with mood disorders than with other psychiatric disorders, and clinicians must look for this association, so as not to miss hypothyroidism which, without treatment, will aggravate the clinical picture of a disorder from mood to resistance to pharmacological treatment and increased prevalence of suicide. Longitudinal cohort studies are needed to explore the clinical significance and potential mechanism of this association.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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